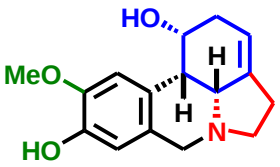
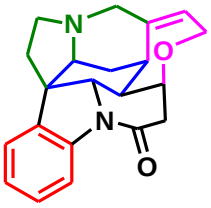
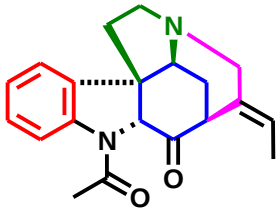
Abstract: Hypervalent iodine reagents have elicited substantial interests in the scientist community during the last decades. Indeed, they have been intensely used as more benign reagents for the environment. As examples, Dess-Martin periodinane or IBX have been used to produce aldehydes and ketones. PIFA and PIDA have demonstrated their abilities to dearomatize phenol and aniline derivatives as substitutes to heavy and toxic metals such as chromium, thallium or osmium salts. Their applications have allowed developing "greener" multi-step total syntheses. In this lecture, asymmetric total syntheses of alkaloids such as (-)-fortucine, (-)-strychnopivotine or strychnine mediated by hypervalent iodine reagents will be discussed. In addition, preliminary results on the development of a "functional protecting group" will be presented. This method is envisaged as an alternative to the free protecting group concept which is often difficult to implement such guidelines when dealing with challenging polyfunctional molecules. A "functional" protecting group is one which not only masks the reactivity of a sensitive ensemble, but it also carries a moiety of the final target, which will be transferred to the substrate at the time of deprotection. This atom economical approach requires only slightly thermic and basic conditions, releases sulfur dioxide as unique by-product and enables the rapid formation of carbocycles and heterocycles present in alkaloids such as indoles.



Fortucine



Strychnine



Strychnopivotine

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